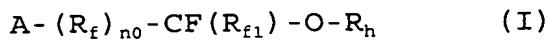


## CLAIMS

## 1. Process for obtaining hydrofluoroethers of formula (I):



wherein:

$n_0$  is zero or 1;

$R_f$  is a bivalent radical:

$C_1 - C_{20}$ , preferably  $C_2 - C_{12}$ , linear or branched (per)fluoroalkylene, optionally containing one or more oxygen atoms;

$-CFW' - (R_{f2}) - CFW -$ , wherein W and W', equal or different, are F,  $CF_3$ ;  $R_{f2}$  is a (per)fluoropolyoxyalkylene containing one or more of the following units, statistically distributed along the chain,  $(C_3F_6O)$ ;  $(CFWO)$  wherein W is as above;  $(C_2F_4O)$ ,  $(CF_2(CF_2)_zCF_2)$  wherein z is an integer equal to 1 or 2;  $(CH_2CF_2CF_2)$ ;  $R_{f1}$  is F or a  $C_1 - C_{10}$  linear or branched (per)fluoroalkyl or (per)fluorooxyalkyl radical;

$R_h$  is a  $C_1 - C_{20}$ , preferably  $C_1 - C_{10}$  linear, branched when possible, saturated or unsaturated when possible alkyl, or  $C_7 - C_{20}$  alkylaryl, optionally containing heteroatoms selected from F, O, N, S, P, Cl; and/or functional groups preferably selected from  $-SO_2F$ ,  $-CH=CH_2$ ,  $-CH_2CH=CH_2$  and  $NO_2$ ;

$A = F, (R_{h2}O) - CF(R_{f4}) - , -C(O)F$ , wherein

- $R_{h2}$ , equal to or different from  $R_h$ , has the  $R_h$  meanings;
- $R_{f4}$ , equal to or different from  $R_{f1}$ , has the  $R_{f1}$  meanings;

wherein a mono- or bifunctional carbonyl compound of formula:



wherein B is F or  $-C(O)R_{f4}$ ,  $R_f$ ,  $R_{f1}$  and  $R_{f4}$  being as above,

is reacted with at least one equivalent of a fluoroformate of formula:



wherein R =  $R_h$  or  $R_{h2}$  as above;

in the presence of an ion fluoride compound (catalyst) and of a dipolar aprotic organic compound, liquid and inert under the reaction conditions.

2. A process according to claim 1, wherein the  $(C_3F_6O)$  unit of  $R_{f2}$  can be  $(CF_2CF(CF_3)O)$  or  $(CF(CF_3)CF_2O)$ .
3. A process according to claims 1-2, wherein in formula (I)  $R_{f1}$  and  $R_{f4}$  of A, independently the one from the other, are F,  $CF_3$ .
4. A process according to claims 1-3, wherein when  $R_f$  of formula (I) is a (per)fluoroalkylene,  $R_f$  is selected from the following groups:  $-CF_2-$ ,  $-CF_2CF_2-$ ,  $-CF_2CF_2CF_2-$ ,

$-\text{CF}_2(\text{CF}_3)\text{CF}-$ ; when  $\text{R}_{\text{f}2}$  contains one oxygen atom it preferably is  $-\text{CF}_2(\text{OCF}_3)\text{CF}-$ .

5. A process according to claims 1-3, wherein  $\text{R}_{\text{f}2}$  is a perfluoropolyoxyalkylene chain having number average molecular weight from 66 to 12,000, preferably from 100 to 5,000, more preferably from 300 to 2,000.
6. A process according to claim 5, wherein when  $\text{R}_{\text{f}2}$  is a perfluorooxyalkylene chain it is preferably selected from the following structures:
  - a)  $-(\text{CF}_2\text{CF}_2\text{O})_m(\text{CF}_2\text{O})_n(\text{CF}_2\text{CF}(\text{CF}_3)\text{O})_p(\text{CF}(\text{CF}_3)\text{O})_q-$ ;
  - b)  $-(\text{CF}_2\text{O})_n(\text{CF}_2\text{CF}(\text{CF}_3)\text{O})_p(\text{CF}(\text{CF}_3)\text{O})_q-$ ;
  - c)  $-(\text{CF}_2\text{CF}_2\text{O})_m(\text{CF}_2\text{O})_n$ ;wherein:

$m$  is comprised between 0 and 100 extremes included;  
 $n$  is comprised between 0 and 50 extremes included;  
 $p$  is comprised between 0 and 100 extremes included;  
 $q$  is comprised between 0 and 60 extremes included;  
 $m+n+p+q>0$  and the number average molecular weight of  $\text{R}_{\text{f}2}$  being in the above limits.
7. A process according to claim 6, wherein  $\text{R}_{\text{f}2}$  is a perfluorooxyalkylene c), and the  $m/n$  ratio ranges from 0.1 to 10,  $n$  being different from zero and the number average molecular weight comprised within the above limits.
8. A process according to claims 1-7, wherein in formula (I)

$R_h$  and  $R_{h2}$  have the following meanings:  $-CH_3$ ,  $-CH_2CH_3$ ,  $-CH_2CH_2CH_3$ ,  $-CH(CH_3)_2$ ,  $-CH_2CH=CH_2$ .

9. A process according to claims 1-8, wherein the ion fluoride compound is any compound capable to generate ion fluorides when, in the presence of dipolar aprotic solvents, at temperatures from 20°C up to 200°C, said dipolar aprotic solvents being acetonitrile, dimethyl-formamide, glyme, ethylene polyoxides dimethylethers (PEO-dimethylethers).
10. A process according to claim 9, wherein the ion fluoride compound is selected from the group comprising metal fluorides, preferably alkaline or alkaline-earth metal fluorides;  $AgF$ ; alkylammoniumfluorides, alkylphosphonium-fluorides, wherein the nitrogen and respectively the phosphor atom can be substituted with one or more  $C_1-C_8$  alkyl groups, equal to or different from each other.
11. A process according to claims 9-10, wherein the ion fluoride compound is  $CsF$  and  $KF$ .
12. A process according to claims 9-11, wherein the catalyst is optionally supported.
13. A process according to claims 1-12, wherein the catalyst amounts, expressed in % by moles, are in the range 0.1%-50% with respect to the mono- or bifunctional carbonyl compound of formula (IV).